

REMARKS

Applicants appreciate the Examiner's thorough consideration provided the present application. Claims 1, 2, 4-6 and 8 are now present in the application. Claims 1 and 5 have been amended. Claims 1 and 5 are independent. Reconsideration of this application, as amended, is respectfully requested.

Claim Rejections under 35 U.S.C. § 103

Claims 1, 2, 4-6 and 8 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Lee, "Fast head modeling for animation", in view of Migdal, U.S. Patent No. 6,208,347. This rejection is respectfully traversed.

In light of the foregoing amendments to the claims, Applicants respectfully submit that this rejection has been obviated and/or rendered moot. As the Examiner will note, independent claims 1 and 5 have been amended.

Independent claim 1 has been amended to recite a combination of steps including "(a) inputting original 3D model data; (b) drawing 3D feature-lines according to the original 3D model data and user requirements; (c) converting the 3D feature-lines into continuing 3D threads, wherein the 3D threads are composed of connection joints, connection lines, and loops, wherein the connection joints are intersection points of the 3D feature-lines, the connection lines are the 3D feature-lines between two connection joints, and the loops are closed zones constructed by the connection lines; (d) determining a number of sample points on each connection line, adding or deleting the loops from the user, and outputting the 3D

threads; (e) producing a regular triangular grid sample model according to the continuing 3D threads; (f) projecting the regular triangular grid sample model into the original 3D model to produce a reconstructed 3D model; and (g) redetermining the number of the sample points on each connection line, readding or redeleting the loops, and repeating steps (e) and (f) if the reconstructed 3D model does not satisfy resolution requirements from the user, and outputting the reconstructed 3D model if the reconstructed 3D model satisfies the resolution requirements, wherein the sample points for the reconstructed 3D model are located on the connection lines despite of the number of the sample points.”

Independent claim 5 has been amended to recite a combination of steps including “inputting original 3D model data; drawing 3D feature-lines according to the original 3D model data and user requirements; converting the 3D feature-lines into continuing 3D threads, wherein the 3D threads are composed of connection joints, connection lines, and loops, wherein the connection joints are intersection points of the 3D feature-lines, the connection lines are the 3D feature-lines between two connection joints, and the loops are closed zones constructed by the connection lines; determining a number of sample points on each connection line, adding or deleting the loops, and outputting the 3D threads; producing a regular triangular grid sample model according to the 3D threads; projecting the regular triangular grid sample model into the original 3D model to produce a reconstructed 3D model; outputting the reconstructed 3D model, wherein the sample points for the reconstructed 3D model are located on the connection line despite of the number of the sample points.”

Support for the amendments to claims 1 and 5 can be found on page 5, lines 23-30 and page 6, lines 1-4 of the specification as originally filed. Applicants respectfully submit that the above combinations of steps as set forth in independent claims 1 and 5 are not disclosed nor suggested by the references relied on by the Examiner.

The claimed invention obtains the 3D feature-lines from the original 3D model data and user requirements first, converts the 3D feature-lines into 3D threads including the connection joints, the connection lines, and the loops, and then determines the number of sample points on the connection lines (e.g., the nodes on the connection lines as shown in FIG. 4). In other words, in the claimed invention, the connection lines are obtained first, and the number of sample points is subsequently determined. *The number of sample points is adjustable without generating new connection lines.* By selecting a proper number of sample points on the connection lines, the desired resolution for the reconstructed 3D model can be achieved. The more the sample points are selected, the higher the resolution of the reconstructed 3D model will be.

The Examiner has correctly acknowledged that Lee fails to teach “determining a number of sample points on each connection line, adding or deleting the loops, and outputting the 3D threads” as recited in previously presented claims 1 and 5. In fact, Lee simply discloses obtaining the feature points from the generic 3D model first, and then using the “snake” to obtain the correspondence between those points (see Sections 2.2 and 2.2.1 of Lee). In other words, the “snake” (i.e., the line between points) is obtained *after* the feature points are determined. Therefore, the number of the feature points is *fixed* before the snake is obtained. Accordingly, Lee fails to teach “determining a number of sample points on each connection line”

as recited in claims 1 and 5. Even if the number of the feature points were changeable after the snake is obtained, assuming *arguendo*, Lee has to obtain a *new* snake due to the change of the number of the feature points. In addition, the feature points are the original data from the 3D generic model, not the points obtained from the snake. Lee simply discloses that the snake is obtained by connecting the feature points, but fails to teach that the feature points are obtained from the snake. Unlike Lee, in the claimed invention, the sample points are obtained from the connection lines, which is opposite to Lee.

Migdal also fails to cure the deficiencies of Lee. As shown in FIGs. 1, 2a and 2b of Migdal, the 6D data points (original data points) are input to the computer system 3 for reconstruction. Although Migdal in col. 22, lines 38-47 discloses that the 6D data points can be added or removed, those data points are the *original* data points, not the samples points from any lines. In fact, Migdal nowhere discloses obtaining any connection lines as recited in claims 1 and 5. Migdal simply teaches using more or less *original* data points to change the resolution, but fails to teach obtaining any sample points from a non-existing line. Therefore, Migdal also fails to teach “determining a number of sample points on each connection line” as recited in claims 1 and 5.

Therefore, neither of the utilized references discloses a method of reconstructing a regular 3D model by feature-line segmentation as set forth in claims 1 and 5. More specifically, neither of the utilized references discloses the relations between the original 3D model data, 3D feature-lines, 3D threads, sample points, and reconstructed 3D model.

Accordingly, neither of the references utilized by the Examiner individually or in combination teaches or suggests the limitations of independent claims 1 and 5 or their dependent claims. Therefore, Applicants respectfully submit that claims 1 and 5 and their dependent claims clearly define over the teachings of the references relied on by the Examiner.

Accordingly, reconsideration and withdrawal of the rejection under 35 U.S.C. § 103 are respectfully requested.

CONCLUSION

It is believed that a full and complete response has been made to the Office Action, and that as such, the Examiner is respectfully requested to send the application to Issue.

In the event there are any matters remaining in this application, the Examiner is invited to contact Cheng-Kang (Greg) Hsu, Registration No. 61,007 at (703) 205-8000 in the Washington, D.C. area.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§1.16 or 1.17; particularly, extension of time fees.

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Respectfully submitted,

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